

REMARKS

Claims 1-8 were pending in the application. Claims 1, 2, 5, and 7 have been amended. No new matter has been introduced. Claim 4 has been canceled without prejudice or disclaimer. Claim 8 has been withdrawn from consideration by the Examiner as pertaining to a non-elected invention. Thus, claims 1-3 and 5-7 are pending for reconsideration at this time.

In the Specification

The specification is objected to as failing to provide proper antecedent basis for the subject matter of claim 4. Original claim 4 contained the necessary support for itself. However, as claim 4 has been canceled, this objection is now moot.

In the Drawings

The drawings are objected to as failing to show "the spot of said catalyst unit where the maximum temperature is generated" as recited in claim 4. As discussed, claim 4 has been canceled, and this objection is now moot.

Rejections Under 35 U.S.C. § 112, ¶ 1

Claim 4 stands rejected under 35 U.S.C. § 112, ¶ 1 as containing subject matter which was allegedly not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. As claim 4 has been canceled, this rejection is now moot.

Rejections Under 35 U.S.C. § 112, ¶ 2

Claims 2 and 5 stand rejected under 35 U.S.C. § 112, ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, claims 2 and 5 allegedly fail to provide proper antecedent basis for the limitation "said first reaction state detectors". Applicants have amended claims 2 and 5 accordingly. Withdrawal of the rejection under 35 U.S.C. § 112, ¶ 2 is solicited.

Rejections Under 35 U.S.C. § 103(a)

Claims 1, 3, 4, 6, and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,002,150 to Shinohara ("Shinohara" hereafter) in view of U.S. Patent No. 6,117,577 to Wilson ("Wilson" hereafter). Claims 2 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shinohara in view

of U.S. Patent No. 6,165,633 to Negishi ("Negishi" hereafter). Claim 4 has been canceled without prejudice or disclaimer. Applicants respectfully traverse the rejection of claims 1-3 and 5-7 as follows.

The Office Action correctly acknowledges that Shinohara fails to disclose the claimed first *and* second correctors, but asserts that the single corrector of Shinohara "functions as the two separate [correctors] recited since it corrects feed amounts in response to both directions" and that "a single corrector is an obvious expedient over two separate correctors as the mere integration of parts". Applicants respectfully traverse this assertion as follows.

As presently claimed, an embodiment of the present invention includes a first corrector for correcting feed amounts of the raw fuel gas and the oxidation gas, and a second corrector for correcting at least one of the feed amount of the oxidation gas and an amount of the oxidation gas corrected by the first corrector (see Fig. 3; and page 5, lines 25 to 30). Due to the claimed multi-corrector structure, the reformer controlling apparatus of the noted embodiment can accurately control of the feed amount and/or timing of the oxidation gas supplied to the catalyst unit, particularly during transient conditions.

More specifically, when a target amount of fuel gas is increased, the first target amount of methanol vapor, the first target amount of steam, and the first target amount of air is increased (page 7, lines 9 to 12). As shown in Fig. 6, the response of the flow of air in the system is relatively quick, incurring only a relatively small delay in changing to the target amount (page 7, lines 3 to 14). However, the flow response of methanol vapor and steam incurs a larger delay than that of the flow of air, at least partly due to the evaporation delay in the evaporator 9 (page 7, lines 14 to 15). If methanol vapor, steam and air are supplied to the reformer 2 in this state (i.e., the flow of air achieving the target amount before the methanol vapor and/or steam achieve their respective target amounts), excessive partial oxidation reaction occurs in the upstream portion of the reformer 2, which raises the temperature of this portion (page 7, lines 15 to 17) and may damage the reformer 2 if the temperature increase is too high.

While temperature control of fuel gas by the first correction may be performed in this circumstance to reduce a likelihood of damage to the reformer 2, changes to the

flow of methanol vapor and steam incur a delay as noted above. Accordingly, in the presently claimed invention, the flow of air supplied to the reformer 2 may be corrected *again* by the second correction unit 1c, based on the temperature of the upstream portion of the reformer 2 (i.e., where the partial oxidation reaction mainly occurs) as shown in Fig. 7. By performing the first and second corrections in the claimed manner, the temperature of the fuel gas can be kept within an appropriate range, *which could not be done effectively with a single stage corrector* as disclosed by Shinohara due to the slow flow response of methanol vapor and steam.

As such, Applicants submit that the presently claimed multi-correction unit structure is patentably distinct from the cited art. Withdrawal of the prior art rejections and allowance of claims 1-3 and 5-7 is solicited.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

By 

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